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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 85.68691/004	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/02425	International filing date (day/month/year) 23/07/1999	Priority date (day/month/year) 04/08/1998
International Patent Classification (IPC) or national classification and IPC G01N35/00		
Applicant DYNEX TECHNOLOGIES INC. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  03/03/2000	Date of completion of this report  14.11.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Rouault, P  Telephone No. +49 89 2399 2776 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/02425

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

### Description, pages:

1-19 as originally filed

### Claims, No.:

1-27 as received on 01/11/2000 with letter of 01/11/2000

### Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes:	Claims	1-27
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-27
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-27
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

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Reference is made to the following documents:

D1: LITTLE J N ET AL: 'RECENT ADVANCES IN ROBOTIC AUTOMATION OF MICROPLATE ASSAYS' LABORATORY AUTOMATION & INFORMATION MANAGEMENT, vol. 26, no. 2, 1 November 1994 (1994-11-01), pages 89-99, XP000476920 ISSN: 1381-141X

D2: EP-A-0 557 828 (HORIBA LTD ;TAKARA SHUZO CO (JP)) 1 September 1993 (1993-09-01)

D3: US-A-3 912 456 (YOUNG ROBERT R) 14 October 1975 (1975-10-14)

D4: EP-A-0 441 755 (CHEMILA SRL) 14 August 1991 (1991-08-14)

A) First invention, -- Claims 1 to 15:

The subject-matter of the new independent Claims 1 and 14 is considered to be new and non-obvious with respect to the available prior art, because, for the below-mentioned reasons, the combination of a pipette mechanism having an integral clamp for picking up items and a movable arm to which said pipette mechanism is connected is neither disclosed in, nor suggested by, that prior art.

The closest prior art is represented by document D1 which discloses a method, respectively, an apparatus, such as described in the preamble of Claim 14, respectively, Claim 1. Although the wording of that document is misleading since the description of Fig. 9 on page 95 (see the second paragraph) could let think that the pipette mechanism of Fig. 8 further comprises "a hand capable of spreading its fingers", it is clear from Fig. 9 that no such hand is available on said pipette mechanism. It rather seems that this hand is present at the extremity of the robot arm of Fig. 8 and holds the pipette mechanism so that said pipette mechanism can be changed very readily.

Document D2 describes a robot arm having a hand capable of catching a plurality of items, like a tip holder, a vial, etc...

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B) Second invention, -- Claims 16 to 27:

The subject-matter of the new independent Claims 16 and 25 is also new and inventive, because the available prior art neither anticipates nor hints at a retractable drawer which can be ejected to cover at least part of a work area of an automated immunoassay apparatus.

The closest prior art is represented by documents D3 and D4 which both reveal an apparatus having a retractable drawer disposed under a work area when said drawer is closed.

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Claims

- 5 1. An automated immunoassay apparatus (1) comprising:  
a movable arm (7a,7b);  
a pipette mechanism (6) for aspirating and/or  
dispensing fluid, said pipette mechanism (6) being  
connected to said movable arm (7a,7b);  
10 characterised in that:  
said pipette mechanism further comprises an  
integral clamp (23,27,31) for picking up and  
transporting one or more items other than a disposable  
tip (9).
- 15 2. An automated immunoassay apparatus as claimed in  
claim 1, wherein said clamp (23,27,31) comprises a  
collar (27).
- 20 3. An automated immunoassay apparatus as claimed in  
claim 2, wherein said collar (27) is movable in a first  
axial direction.
- 25 4. An automated immunoassay apparatus as claimed in  
claim 1, 2 or 3, wherein said clamp (23,27,31) comprises  
a portion (23) for engagement with a disposable sample  
tip (9) or a reagent tip.
- 30 5. An automated immunoassay apparatus as claimed in  
claim 4, wherein said portion (23), in use,  
substantially resists movement in said first axial  
direction.
- 35 6. An automated immunoassay apparatus as claimed in  
claim 4 or 5, wherein said portion (23) is spring  
loaded.

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7. An automated immunoassay apparatus as claimed in claim 6, wherein said portion (23) may move in a direction opposed to said first axial direction.

5 8. An automated immunoassay apparatus as claimed in any of claims 4-7, wherein said portion (23) co-operates with said collar (27) to clamp a pickup block (34) or other article disposed between said collar (27) and said portion (23).

10 9. An automated immunoassay apparatus as claimed in any preceding claim, wherein said one or more items are selected from a group comprising: a microplate (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack (11), a control container, a control rack (15), and a tip rack (8;12).

20 10. An automated immunoassay apparatus as claimed in any preceding claim, further comprising a pickup block (34) and wherein said clamp (23,27,31) engages in use with a slot or recess (32) provided in said pickup block (34).

25 11. An automated immunoassay apparatus as claimed in claim 10, wherein said pickup block (34) is connected to a holder (35) suitable for carrying a microplate (13).

30 12. An automated immunoassay apparatus as claimed in claim 10 or 11, wherein said clamp (23,27,31) and/or said pickup block (34) further comprise anti-rotation means (27,36) for substantially preventing said pickup block (34) and any item attached thereto from rotating.

35 13. An Enzyme Linked ImmunoSorbent Assay system comprising automated immunoassay apparatus as claimed in any preceding claim.

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14. A method of automatically performing immunoassay procedures comprising:

providing a movable arm (7a,7b);  
aspirating and/or dispensing fluid using a pipette  
5 mechanism (6), said pipette mechanism (6) being  
connected to said movable arm (7a,7b);

characterised in that said method further comprises  
the step:

picking up and transporting one or more items other  
10 than a disposable tip (9) using said pipette mechanism  
(6) having an integral clamp (23,27,31).

15 15. A method as claimed in claim 14, wherein said  
method is used for carrying out Enzyme Linked  
ImmunoSorbent Assay procedures.



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16. An automated immunoassay apparatus comprising:  
at least one washer (17), reader (18) or incubator  
(16) module; and  
a work area (2) where, in use, components and  
5 consumables necessary for carrying out diagnostic tests  
are arranged;  
characterised in that said apparatus further  
comprises:  
a retractable drawer (14) for holding at least one  
10 first item selected from the group comprising: a  
microplate (13), a plate holder (35), one or more sample  
tubes, a sample rack (4), a reagent container, a reagent  
rack (11), a control container, a control rack (15), and  
a tip rack (8;12), said retractable drawer (14) being  
15 disposed above said work area (2) and wherein said  
retractable drawer (14) may be withdrawn to provide  
access to said work area (2) and may be ejected to cover  
at least part of said work area (2).
- 20 17. An automated immunoassay apparatus as claimed in  
claim 16, wherein said retractable drawer (14) comprises  
an aperture through which a disposable tip (8;12) may be  
passed in use.
- 25 18. An automated immunoassay apparatus as claimed in  
claim 17, further comprising a chute (42) arranged for  
receiving a disposable tip (8;12) passed in use through  
said aperture in said retractable drawer (14) when said  
retractable drawer (14) is at least partially extended.
- 30 19. An automated immunoassay apparatus as claimed in  
claim 18, wherein said chute (42) is generally aligned  
with said aperture in said retractable drawer (14) when  
said retractable drawer (14) is fully extended.

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20. An automated immunoassay apparatus as claimed in any of claims 16-19, wherein said retractable drawer (14) is arranged to hold at least one, at least two, at least three or at least four microplates (13).

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21. An automated immunoassay apparatus as claimed in any of claims 16-20, wherein said retractable drawer (14) is at least partially retractable whilst said at least one first item is held, in use, on said retractable drawer (14).

10

22. An automated immunoassay apparatus as claimed in any of claims 16-21, wherein said at least one first item comprises a microplate (13) and said apparatus further comprising transport means (23,27,31) for moving said microplate (13) to said at least one washer (17), reader (18) or incubator (16) module.

15

23. An automated immunoassay apparatus as claimed in any of claims 16-22, further comprising transport means (23,27,31) for moving said at least one first item, said transport means (23,27,31) comprising a pipette means (6) having an integral clamp.

20

24. An automated immunoassay apparatus as claimed in claim 23, wherein said transport means (23,27,31) comprises an end portion (23) for receiving a disposable tip (8;12) and a collar portion (27), said collar portion (27) being movable to clamp a said first item and/or to eject a disposable tip (8;12) held on said end portion (23).

25

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25. A method of automatically performing immunoassay procedures, comprising the steps of:

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providing at least one washer (17), reader (18) or incubator (16) module; and

providing a work area (2) where, in use, components and consumables necessary for carrying out diagnostic

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tests are arranged;

characterised in that said method further comprises the step of:

5 using a retractable drawer (14) to hold at least one item selected from the group comprising: a microplate (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack (11), a control container, a control rack (15), and  
10 a tip rack (8;12), said retractable drawer (14) being disposed above said work area (2) and wherein said retractable drawer (14) may be withdrawn to provide access to said work area (2) and may be ejected to cover at least part of said work area (2).

15 26. A method of automatically performing immunoassay procedures as claimed in claim 25, wherein said at least one item comprises a microplate (13), said method further comprising the step of transporting said microplate (13) from said retractable drawer (14) to  
20 said at least one washer (17), reader (18) or incubator (16) module using a pipette means (6) having an integral clamp.

25 27. A method as claimed in claim 25 or 26, wherein said method is used for carrying out Enzyme Linked ImmunoSorbent Assay procedures.

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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: **AUTOMATED IMMUNOASSAY APPARATUS WITH FLEXIBLE PICK-UP ARM**

## (57) Abstract

An automated sample handling apparatus is disclosed having a pipette mechanism (6) which has an integral clamp device (27, 31, 23) suitable for picking up one or more items other than a disposable tip (8; 12) such as a plate holder (35) which can carry a microplate or other consumable item(s). A retractable drawer (14) for carrying a plurality of microplates (13) is also provided.

